

Machine Learning Scientist with expertise in Recommendation, Outlier Detection and Algorithmic Fairness.

EDUCATION

- **Northeastern University** Boston, MA
Ph.D. in Computer Science - Advisor: Huy Le Nguyen, GPA 3.85 *Sep. 2019 – May 2024 (Expected)*
- **Missouri State University** Springfield, MO
Bachelor of Science in Computer Science, GPA: 3.89 *Aug. 2014 – May. 2019*

EXPERIENCE

- **Machine Learning Engineer Intern: AI for Cyber Security** May 2023 - Aug 2023
Uptycs *Waltham, MA*
 - **Unsupervised Anomaly Detection:** Designed an ensemble clustering algorithm to robustly identify outlier patterns of local endpoint behaviors and remote port activities. Achieved a Rand score up to 95% when compared to ground truth labels.
 - **Measuring Clustering Robustness:** Designed an efficient minimum-weight perfect matching algorithm to quantify robustness of clustering result in presence of distribution shift. Enabled automated model reuse when data distribution changes without the need to compute new clusters.
- **Research Assistant: Fair and Private Machine Learning Models** Aug 2019 - Present
Northeastern University *Boston, MA*
 - **Fair Multi-agent Multi-armed Bandit:** The first efficient and near-optimal algorithms with improved runtime (up to 65% speed-up) and regret (up to 50% reduction) over the previous state-of-the-art. Published in AAAI 2023. [\[PDF\]](#)
 - **k-center Clustering with Group Fairness:** Improved runtime (up to 75% speed-up) and approximation factor (exponential to constant) over the previous state-of-the-art. Published in ICML 2020. [\[PDF\]](#) [\[Github\]](#)
 - **Differentially Private Clustering:** Improved approximation guarantee of the previous state-of-the-art private k -medians and k -means algorithms for a dataset of size n by a factor of $\sqrt{k \log n}$ and $\sqrt{\log n}$ respectively. Published in AAAI 2021. [\[PDF\]](#)
- **Teaching Assistant: Algorithm and Data (CS300)** Spring 2020, 2021
Northeastern University *Boston, MA*

ACCOMPLISHMENTS AND SELECTED PROJECT

5 Papers Published in Top AI and Machine Learning Conferences (ICML, ICLR). [\[Complete List of Papers\]](#)

1 Paper Accepted as an Oral Presentation in AAAI 2023. [\[PDF\]](#)

Decentralized Bandit Network with TCP & UDP (C++) [\[Link\]](#)

- Designed a central server (TCP) and a peer-to-peer (UDP) protocol for the private decentralized bandit algorithm to determine the click-through rate of different ads.
- Designed a heartbeat protocol to detect systems failures of peers, maintain a list of active peers, and synchronize recently added peers and returning peers with the rest.
- Conducted experiments on the heartbeat protocol's robustness by measuring the the number of rounds per second to determine the best-valued ad. The protocol's speed degrades gracefully as the message drop rate increases, confirming the protocol's robustness.

SKILLS

- **Coding:** Python (PyTorch, NumPy, scikit-learn, pandas), C++, SQL.
- **Machine Learning:** Multi-armed Bandits, Optimization, Deep Learning, Clustering.
- **Algorithms:** Approximation Algorithms, Combinatorial Optimization, Differential Privacy.